WHAT IS CLAIMED IS:

1. A wavelength filter comprising

a plurality of lattice structures that are arranged at predetermined intervals in the direction of an optical axis,

each of the lattice structures having regions of two different refractive indices that are alternately arranged.

2. The wavelength filter as claimed in claim 1, wherein the average refractive index of the lattice structures is higher than the refractive index of areas for transmitting light before and behind the lattice structures.

3. The wavelength filter as claimed in claim 1, wherein the regions of two different refractive indices are alternately arranged in a direction perpendicular to the optical axis.

4. The wavelength filter as claimed in claim 1, wherein the predetermined intervals are uniform.

5. The wavelength filter as claimed in claim 1, wherein the lattice structures are formed on a substrate on which an optical waveguide path is also formed.

6. The wavelength filter as claimed in claim 1, wherein the optical waveguide path is directly connected to the lattice structures.

7. The wavelength filter as claimed in claim 1, wherein the optical waveguide path includes optical fibers.

8. The wavelength filter as claimed in claim 1, comprising two or three of the lattice structures.

9. A variable wavelength filter comprising

a plurality of lattice structures that are arranged at predetermined intervals in the direction of an optical axis,

each of the lattice structures having regions of two different substances that are alternately arranged, and

at least one of the substances being an electrooptical material.

10. The variable wavelength filter as claimed in claim 9, further comprising electrodes for inducing an electric field in the lattice structures.

11. The variable wavelength filter as claimed in claim 9, wherein the average refractive index of the lattice structures is higher than the refractive index of areas for transmitting light before and behind the lattice structures.

12. The variable wavelength filter as claimed in claim 9, wherein the regions of two different substances are alternately arranged in a direction perpendicular to the optical axis.

13. The variable wavelength filter as claimed in claim 9, wherein the predetermined intervals are uniform.

14. The variable wavelength filter as claimed in claim 9, wherein the lattice structures are formed on a substrate on which an optical waveguide path is also formed.

15. The variable wavelength filter as claimed in claim 9, wherein the optical waveguide path is directly connected to the lattice structures.

16. The variable wavelength filter as claimed in claim 9, wherein the electrooptical material includes at least one of $LiNbO_3$, $LiTaO_3$, $Pb(Zr, Ti)O_3$, and $(Pb, La)(Zr, Ti)O_3$.

17. The variable wavelength filter as claimed in claim 10, wherein the electrodes are formed on at least either the light reflection faces or the light transmission faces of the lattice structures.

18. The variable wavelength filter as claimed in claim 17, wherein the electrodes are transparent electrodes.

19. The variable wavelength filter as claimed in claim 10, wherein the electrodes are common to two or more of the lattice structures.

20. An optical device comprising

one or more wavelength filters that are formed on a single substrate,

each of the wavelength filters including a plurality of lattice structures that are arranged at predetermined intervals in the direction of an optical axis, and

each of the lattice structures having regions of two different refractive indices that are alternately arranged.

21. An optical device comprising

one or more variable wavelength filters that are formed on a single substrate,

each of the variable wavelength filters including

a plurality of lattice structures that are arranged at predetermined intervals in the direction of an optical axis,

each of the lattice structures having regions of two different substances that are alternately arranged, and

at least one of the substances being an electrooptical material.

22. An optical device comprising

two or more wavelength filters that are formed on a single substrate,

each of the wavelength filters including a plurality of lattice structures that are arranged at predetermined intervals in the direction of an optical axis,

each of the lattice structures having regions of two different refractive indices that are alternately arranged, and

the distance between the wavelength filters being longer than each of the predetermined intervals.

23. An optical device comprising

two or more variable wavelength filters that are formed on a single substrate,

each of the variable wavelength filters including a plurality of lattice structures that are arranged at predetermined intervals in the direction of an optical axis,

each of the lattice structures having regions of two different substances that are alternately arranged,

at least one of the substances being an electrooptical material, and

the distance between the variable wavelength filters being longer than each of the predetermined intervals.